Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services

STATEMENT OF BASIS

Ouachita Power Generating Plant
Part 70 Permit Renewal
Entergy Arkansas, Inc.
Sterlington, Ouachita Parish, Louisiana
Agency Interest Number: 83613
Activity Number: PER20040001
Draft Permit 2160-00111-V1

I. APPLICANT:

Company:
Entergy Arkansas, Inc.
350 Harvey Gregg Road
Sterlington, LA 71280

Facility:
Ouachita Power Generating Plant
Sterlington, Ouachita Parish, Louisiana
Approximate UTM coordinates are 587.14 kilometers East and 3618.84 kilometers North, Zone 15

II. FACILITY AND CURRENT PERMIT STATUS:

Entergy Arkansas, Inc. owns and operates an electric power generation plant near Sterlington in Ouachita Parish. The plant, known as the Ouachita Power Generating Plant, has been in operation since 2001. The Ouachita Power Generating Plant has a capacity of 815 megawatts.

The facility submitted a timely application for a Part 70 permit renewal and operates pursuant to the "application shield" provided in the program.

The facility operates under Permits No.: 2160-00111-V0, issued on June 21, 2000; PSD-LA-651, issued on June 20, 2000; and 2160-00111-IV0, issued on July 24, 2000; which will remain effective until replaced by a Part 70 permit renewal.

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III. PROPOSED PERMIT / PROJECT INFORMATION:

Proposed Permit

A permit application and Emission Inventory Questionnaire was submitted by Ouachita Power LLC on December 14, 2004 requesting a Part 70 operating permit renewal. Additional information dated September 13, 2006, February 7, 2008, and February 12, 2009, was also received.

Project description

The Ouachita Power Generating Plant consists of three natural gas-fired combustion turbine combined-cycle power units and support equipment. The Ouachita Power Generating Plant generates electricity to meet market conditions for electricity demand. Each combined-cycle unit consists of a combustion turbine/generator exhausting to a heat recovery steam generator equipped with duct burners, where the waste heat in exhaust gas is used to generate steam used to drive a steam turbine/generator. The nominal generating capacity of the entire facility from fuel firing and steam recovery is 815 megawatts (MW).

Each combined-cycle unit consists of one General Electric PG7241FA gas turbine. The turbine generator consists of an air compressor, fuel system, power turbine, and a 60-hertz, 18-kilovolt generator. The turbine operates on natural gas only. The unit operates on demand with loads ranging from 75% to 100% after the startup cycle is completed. The primary emissions from the turbine consist of NO_X, CO, SO_2, PM_{10}, and VOC. The turbine is equipped with General Electric advanced dry low-NO_X combustors (DLN III). A selective catalytic reduction (SCR) system, using aqueous ammonia as a reducing reagent, further controls emissions of NO_X. Sulfur Dioxide emissions are controlled by the use of pipeline quality natural gas. Emissions of particulate matter and volatile organic compound emissions are minimized by the use of fuels with low ash contents and optimization of combustion parameters to provide for complete combustion. Combustion gases from the combustion turbine/HRSG are discharged to the atmosphere through an 18 foot diameter, 150 foot tall stack.

A supplementary-fired horizontal, natural circulation, three-pressure, heat recovery steam generator (HRSG) extracts heat from the turbine exhaust gas. The HRSG generates steam for power generation and heat for feed water. The HRSG produces high-pressure steam, intermediate-pressure steam, and low-pressure steam for power generation. The HRSG powers a triple-admission, reheat condensing steam turbine. The catalyst bed for NO_X emissions is located within the HRSG.

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The Ouachita Power Generating Plant has one natural gas-fired startup boiler. The boiler provides steam to the steam turbine gland seals during preheating and turbine startup operations and is equipped with low NO_X burners. Each combustion turbine has a natural gas-fired indirect water bath heater, manufactured by NATCO, incorporating low NO_X burners. These heaters are used to heat a water and anti-freeze solution that heats the natural gas to 70° F before it enters the main turbine. The plant also uses an emergency powered generator, an emergency fire pump, and cooling towers.

With this modification, Ouachita Power Generating Plant proposes to:

- Renew its Part 70 permit;
- Rename the ammonia tanks to indicate that they contain 28% aqueous ammonia and not 50% aqueous ammonia;
- Recalculate the particulate emissions from the cooling towers such that all particulate emissions are considered to be PM_{10}, instead of total suspended particulate;
- Incorporate startup and shutdown emissions into the permit; and
- Correct errors in the calculations used to establish the NOx and CO emission rates that were determined as BACT. This correction will result in a decrease in permitted emissions.

Permitted Air Emissions

Estimated changes in permitted emissions in tons per year are as follows:

Pollutant	Before	After	Change
PM_{10}	316.07	442.01	+ 125.94**
SO_2	151.79	151.38	- 0.41
NO_X	614.28	579.32	- 34.96
CO	813.96	769.19	- 44.77
VOC	96.62	96.54	- 0.08

** Emission change due to difference in calculation methodology. In Permit No. 2160-00111-V0, the particulate emissions from the Cooling Towers (EQTs 7 – 9) were considered to be total suspended particulate and were calculated separately from PM_{10}. In this permit, the emissions from the cooling towers are considered to be PM_{10}. If the emissions from each of the cooling towers are added to the PM_{10} "Before" value above, the result is 442.37 tons per year. This represents a permitted decrease of 0.36 tons per year.

Prevention of Significant Deterioration Applicability

Ouachita Power proposes no physical changes or modifications to the Ouachita Power Generating Plant that would cause a triggering of Prevention of Significant Deterioration analysis.

The emissions changes above reflect permitted emissions allowed by Permit No. PSD-LA-651. Permit No. PSD-LA-651(M-1) does not authorize any additional construction or any changes in actual emissions. PSD-LA-651(M-1) authorizes maximum emission rates of nitrogen oxides and carbon monoxide, in pounds per hour, that apply during startup and shutdown of the Combustion Turbines (CTG01, CTG02, and CTG03). All emissions sources at this facility are required to continue to comply with all existing annual emission rates for all pollutants.

Further, PSD-LA-651(M-1) authorizes a revision to the NOx and CO lb/hr and TPY emission rates for the Combined Cycle Units. Previously, these rates were 46.0 lb/hr and 201.0 TPY of NOx as well as 61.0 lb/hr and 267.0 TPY of CO. When these rates were originally established, the underlying calculations did not account for the fact that the vendor guarantees at 100% load were lower than the emission rate relied upon in the emission calculation. Using the vendor guarantees, the NOx emission rates were revised to 43.50 lb/hr and 190.53 TPY. The CO emission rates were revised to 58.00 lb/hr and 254.04 TPY. This results in a decrease in permitted emissions of NOx and CO. Further PSD review is not required since this change results in a reduction in permitted emissions. This change does not represent a physical change or a change in the method of operation.

The proposed permit was reviewed for compliance with 40 CFR 70, the Louisiana Air Quality Regulations and Prevention of Significant Deterioration (PSD). New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAP) do not apply.

MACT requirements

TAP emissions are emitted by nine point sources at this facility: Combined Cycle Combustion Turbine Unit 1 (EQT 1), Combined Cycle Combustion Turbine Unit 2 (EQT 2), Combined Cycle Combustion Turbine Unit 3 (EQT 3), Fuel Heater 1 (EQT 4), Fuel Heater 2 (EQT 5), Fuel Heater 3 (EQT 6), Diesel Firewater Pump (EQT 10), Auxiliary Boiler (EQT 12), Diesel Emergency Generator (EQT 14). Electric utility steam-generating units (EUSGUs) are not required to incorporate Maximum Achievable Control Technology (MACT) per LAC 33:III.5105.B.2. EQT 4, EQT 5, and EQT 6 are EUSGUs and are therefore not subject to the requirements of MACT. Emissions from the combustion of Group 1 virgin fossil fuels are exempt from the requirement to address MACT per LAC 33:III.5105.B.3.a. Formaldehyde emissions from EQTs 1-3 and EQT 12 are generated by combustion of natural gas, a Group 1 virgin fossil fuel, and are exempted from the requirement to address MACT. Formaldehyde emissions from EQT 10 and EQT 14 are generated by combustion of natural gas, a Group 1 virgin fossil fuel, and are exempted from the requirement to address MACT. MACT is not required for emissions of any Class III TAP, such as ammonia.

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Air Modeling Analysis

Dispersion Model Used: AERMOD

Pollutant	Time Period	Calculated Maximum Ground Level Concentration	Louisiana Toxic Air Pollutant Ambient Air Quality Standard or (National Ambient Air Quality Standard {NAAQS})
PM	24-hour	122.70 $\mu g/m^3$	(150 $\mu g/m^3$)
	Annual	27.18 $\mu g/m^3$	(50 $\mu g/m^3$)

General Condition XVII Activities

The facility will comply with the applicable General Condition XVII Activities emissions as required by the operating permit rule. However, General Condition XVII Activities are not subject to testing, monitoring, reporting or recordkeeping requirements. For a list of approved General Condition XVII Activities, refer to Section VIII of the draft Part 70 permit.

Insignificant Activities

All Insignificant Activities are authorized under LAC 33:III.501.B.5. For a list of approved Insignificant Activities, refer to Section IX of the draft Part 70 permit.

The applicability of the appropriate regulations is straightforward and provided in the Facility Specific Requirements Section of the draft permit. Similarly, the Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions and standards are provided in the Facility Specific Requirements Section of the draft permit.

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IV. Permit Shields

There is no permit shield.

V. Periodic Monitoring

Compliance Assurance Monitoring

Federal regulation 40 CFR 64-Compliance Assurance Monitoring is not applicable to this facility.

NOx Continuous Emissions Monitoring System (CEMS)

Ouachita Power Generating Plant is required by 40 CFR 60 Subpart Db to monitor emissions of NOx from each of the duct burners (EQT 18, EQT 19, and EQT 20) using a NOx CEMS. Ouachita Power Generating Plant is required by 40 CFR 75 – Continuous Emissions Monitoring to monitor emissions of NOx from each of the combined cycle units (PCS 1, PCS 2, and PCS 3) using a NOx CEMS. LDEQ has determined that compliance with 40 CFR 75 – Continuous Emissions Monitoring is compliance with 40 CFR 60 Subpart Db because 40 CFR 75 is more stringent.

Ouachita Power Generating Plant is required to continuously monitor, record, and report the NOx emissions from the combined cycle units referenced above. Further, Ouachita Power Generating Plant is required to maintain the records indicated above for no less than five years from the date the record was generated.

CO Performance/Emissions Test

Ouachita Power Generating Plant is required to conduct a performance/emissions test on each of the combined cycle units (PCS 1, PCS 2, and PCS 3) that will indicate the actual emissions of carbon monoxide. The purpose of this test is to demonstrate compliance with the emission limits of Permit No. 2160-00111-V1. This test will be conducted once every five years, plus or minus 6 months of when the previous test was performed. Within sixty (60) days of the conclusion of the above mentioned test, Ouachita Power Generating Plant will submit the test results to LDEQ for review.

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VI. Explanation for Exemption Status or Non-Applicability of a Source

ID No:	Requirement	Notes
UNF001	Chemical Accident Prevention and Minimization of Consequences [LAC 33:III.5901]	DOES NOT APPLY. The Ouachita Power Generating Plant contains no sources which produce, handle, process, or store substances listed in LAC 5907.A Table A in quantities greater than the listed threshold.
	Compliance Assurance Monitoring [40 Part 64.2(b)(1)(iii)]	EXEMPT. The Ouachita Power Generating Plant is subject to Acid Rain requirements. [40 CFR 64.2(b)(iii)]
	Chemical Accident Prevention Provisions [40 CFR 68]	DOES NOT APPLY. The Ouachita Power Generating Plant contains no sources which produce, handle, process, or store substances listed in 40 CFR 68.130 in quantities greater than the listed threshold.
EQT001, EQT002, EQT003	Comprehensive Toxic Air Pollutant Emission Control Program [LAC 33:III.5105.B.2]	EXEMPT. MACT is not required for emissions of Ammonia, a Class III TAP. [LAC 5109.A.1] Formaldehyde emissions result from the combustion of natural gas, a Group 1 Virgin Fossil Fuel. [LAC 33:III.5105.B.3.a]
	NESHAP Subpart YYYY - National Emission Standard for Hazardous Air Pollutants for Stationary Combustion Turbines	DOES NOT APPLY. Turbines are not located at a major source of HAPs. [40 CFR 63.6080]
EQT007, EQT008, EQT009	NESHAP Subpart Q – National Emission Standards for Hazardous Air Pollutants for Industrial Cooling Towers [40 CFR 63.400(a)]	DOES NOT APPLY. The Ouachita Power Generating Plant does not use chromium based water treatment chemicals in the cooling water or cooling tower.
EQT012, EQT014	NSPS IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines	DOES NOT APPLY. Engines were constructed in June 2002. [40 CFR 63.4200(a)(2)]

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ID No:	Requirement	Notes
EQT012, EQT014 (cont)	NESHAP ZZZZ - National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines	DOES NOT APPLY. Engine is an existing compression ignition stationary reciprocating internal combustion engine. [40 CFR 63.6590(b)(3)]
EQT015, EQT016, EQT017	Storage of Volatile Organic Compounds [LAC 33:III.2103]	DOES NOT APPLY. Tanks do not store any volatile organic compounds. [LAC 33:III.2103.A]
EQT018, EQT019, EQT020	Comprehensive Toxic Air Pollutant Emission Control Program [LAC 33:III.Chapter 51]	EXEMPT. Sources are electric utility steam-generating units. [LAC 33:III.5105.B.2]
PCS001 PCS002 PCS003	Control of Emissions of Sulfur Dioxide [LAC 33:III.1503]	EXEMPT. Sources emit less than 100 TPY of SO_2. Permittee shall maintain records showing annual potential SO_2 emissions. [LAC 33:III.1513.C]

VII. Streamlined Requirements			
Unit or Plant Site	**Programs Being Streamlined**	**Stream Applicability**	**Overall Most Stringent Program**
Ouachita Power Generating Plant	Not Applicable		

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VIII. Glossary

Best Available Control Technologies (BACT) - An emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under this part which would be emitted from any proposed major stationary source or major modification which the administrative authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant.

CAM - Compliance Assurance Monitoring rule – A federal air regulation under 40 CFR Part 64

Carbon Black - A black colloidal substance consisting wholly or principally of amorphous carbon and used to make pigments and ink.

Carbon Monoxide (CO) – (Carbon monoxide) a colorless, odorless gas produced by incomplete combustion of any carbonaceous (gasoline, natural gas, coal, oil, etc.) material.

Continuous Emission Monitoring System (CEMS) – The total combined equipment and systems required to continuously determine air contaminants and diluent gas concentrations and/or mass emission rate of a source effluent.

Cooling Tower – A cooling system used in industry to cool hot water (by partial evaporation) before reusing it as a coolant.

Cyclone – A control device that uses centrifugal force to separate particulate matter from the carrier gas stream.

Duct Burner – A device that combusts fuel and that is placed in the exhaust duct from another source (such as a stationary gas turbine, internal combustion engine, kiln, etc.) to allow the firing of additional fuel to heat the exhaust gases before the exhaust gases enter a steam generating unit.

Federally Enforceable Specific Condition - A federally enforceable specific condition written to limit the potential to Emit (PTE) of a source that is permanent, quantifiable, and practically enforceable. In order to meet these requirements, the

draft permit containing the federally enforceable specific condition must be placed on public notice and include the following conditions:

- A clear statement of the operational limitation or condition which limits the source's potential to emit;
- Recordkeeping requirements related to the operational limitation or condition;
- A requirement that these records be made available for inspection by LDEQ personnel;
- A requirement to report for the previous calendar year.

Grandfathered Status- Those facilities that were under actual construction or operation as of June 19, 1969, the signature date of the original Clean Air Act. These facilities are not required to obtain a permit. Facilities that are subject to Part 70 (Title V) requirements lose grandfathered status and must apply for a permit.

Heat Recovery Steam Generator (HRSG) – A steam generator that recovers exhaust heat from a gas turbine, and provides economizing and steam generation surfaces.

Hydrogen Sulfide (H_2S) - A colorless inflammable gas having the characteristic odor of rotten eggs, and found in many mineral springs. It is produced by the action of acids on metallic sulfides, and is an important chemical reagent.

Maximum Achievable Control Technology (MACT) - The maximum degree of reduction in emissions of each air pollutant subject to LAC 33:III.Chapter 51 (including a prohibition on such emissions, where achievable) that the administrative authority, upon review of submitted MACT compliance plans and other relevant information and taking into consideration the cost of achieving such emission reduction, as well as any non-air-quality health and environmental impacts and energy requirements, determines is achievable through application of measures, processes, methods, systems, or techniques.

National Emission Standards for Hazardous Air Pollutants (NESHAP) -Air emission standards for specific types of facilities, as outlined in 40 CFR Parts 61 through 63

New Source Performance Standards (NSPS) – Air emission standards for specific types of facilities, as outlined in 40 CFR Part 60

New Source Review (NSR) - A preconstruction review and permitting program applicable to new or modified major stationary sources of air pollutants regulated under the Clean Air Act (CAA). NSR is required by Parts C ("Prevention of

Significant Deterioration of Air Quality") and D ("Nonattainment New Source Review").

Nitrogen Oxides (NO_x) - Compounds whose molecules consists of nitrogen and oxygen.

Nonattainment New Source Review (NNSR) - A New Source Review permitting program for major sources in geographic areas that do not meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. Nonattainment NSR is designed to ensure that emissions associated with new or modified sources will be regulated with the goal of improving ambient air quality.

Organic Compound - Any compound of carbon and another element. Examples: Methane (CH_4), Ethane (C_2H_6), Carbon Disulfide (CS_2)

Part 70 Operating Permit- Also referred to as a Title V permit, required for major sources as defined in 40 CFR 70 and LAC 33:III.507. Major sources include, but are not limited to, sources which have the potential to emit: $\geq$ 10 tons per year of any toxic air pollutant; $\geq$ 25 tons of total toxic air pollutants; and $\geq$ 100 tons per year of regulated pollutants (unless regulated solely under 112(r) of the Clean Air Act) (25 tons per year for sources in non-attainment parishes).

PM_{10}- Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by the method in Title 40, Code of Federal Regulations, Part 50, Appendix J.

Potential to Emit (PTE) - The maximum capacity of a stationary source to emit any air pollutant under its physical and operational design.

Prevention of Significant Deterioration (PSD) – A New Source Review permitting program for major sources in geographic areas that meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. PSD requirements are designed to ensure that the air quality in attainment areas will not degrade.

Selective Catalytic Reduction (SCR) – A noncombustion control technology that destroys NO_X by injecting a reducing agent (e.g., ammonia) into the flue gas that, in the presence of a catalyst (e.g., vanadium, titanium, or zeolite), converts NO_X into molecular nitrogen and water.

Sulfur Dioxide (SO_2) – An oxide of sulphur.

TAP - Toxic Air Pollutant - LDEQ acronym for air pollutants regulated under LAC 33 Part III, Chapter 51, Tables 1 through 3

Title V permit – See Part 70 Operating Permit.

"Top Down" approach – An approach which requires use of the most stringent control technology found to be technically feasible and appropriate based on environmental, energy, economic, and cost impacts.

Turbine – A rotary engine in which the kinetic energy of a moving fluid is converted into mechanical energy by causing a bladed rotor to rotate.

Volatile Organic Compound (VOC) - Any organic compound which participates in atmospheric photochemical reactions; that is, any organic compound other than those which the administrator of the U.S. Environmental Protection Agency designates as having negligible photochemical reactivity.